

**SECTION 23 01 30
AIR DUCT CLEANING**

PART 1 - GENERAL**1.1 DESCRIPTION**

- A. This section includes cleaning of the following existing duct systems:
 - 1. Return Duct
 - 2. Exhaust Duct
- B. Definitions:
 - 1. ASCS: Air system cleaning specialist.
 - 2. NADCA: National Air Duct Cleaners Association.
 - 3. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.2 RELATED WORK

- A. Section Entitled, GENERAL CONDITIONS.
- B. Section 23 05 11, COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION.
- C. Section 23 31 00, HVAC DUCTS AND CASINGS.

1.3 QUALITY ASSURANCE

- A. ASCS Qualifications: A certified member of NADCA.
 - 1. Certification: Employ an ASCS certified by NADCA on a full-time basis.
 - 2. Supervisor Qualifications: Certified as an ASCS by NADCA.
 - 3. Experience: Submit records of experience in the field of HVAC systems cleaning.
 - 4. Equipment, Materials and Labor: Have equipment, materials and labor required to perform specified services.
- B. Comply with current published standards of NADCA.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, and with requirements in the individual specification sections.
- B. Manufacturer Certificates: Signed by manufacturers certifying that products comply with requirements.
- C. Qualification Data: For ASCS.
- D. Field quality control test reports.

PART 2 - PRODUCTS**2.1 DUCT-MOUNTED ACCESS DOORS**

- A. General Description: Fabricate doors airtight and suitable for duct pressure class. ASCS shall be responsible for installing access doors in

accordance with NADCA standards and as required to perform the duct cleaning services on this project.

- B. Rectangular Duct Door: Double wall; fabricated of galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1 inch butt or piano hinge and cam latches.

1. Manufacturers:

- a. Air Balance, Inc.; a Mestek Company
 - b. American Warming and Ventilating
 - c. Cesco Products.
 - d. Ductmate Industries, Inc.
 - e. Flexmaster U.S.A., Inc.
 - f. Greenheck
 - g. McGill AirFlow Corporation
 - h. Nailor Industries, Inc.
 - i. Ruskin Company; Tomkins PLC
 - j. Ventfabrics, Inc.
 - k. Ward Industries, Inc.
2. Frame: Galvanized steel sheet with bend-over tabs and foam gaskets.
3. Provide number of hinges and locks as follows:
- a. Less than 12 Inches Square: Secure with two sash locks.
 - b. Up to 18 Inches Square: Two hinges and two sash locks.
 - c. Up to 24 by 48 Inches: Three hinges and two compression latches.
 - d. Sizes 24 by 48 Inches and Larger: Four hinges and two compression latches.

- C. Round Duct Door: Double wall; fabricated of galvanized sheet metal with insulation fill and 1-inch thickness. Include cam latches.

1. Manufacturers:

- a. Flexmaster U.S.A., Inc.
2. Frame: Galvanized steel sheet with spin-in notched frame.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Systems to determine appropriate methods, tools and equipment required for performance of work.
- B. Prepare written report listing conditions detrimental to performance of work.
- C. Proceed with work only after unsatisfactory conditions have been corrected.

3.2 CLEANING

- A. Engage a qualified ASCS to clean the following systems:

1. Return system - from area of work back to air handling equipment.
2. Exhaust system - from area of work back to air handling equipment.
- B. Perform cleaning before air balancing or mark position of dampers and air-directional mechanical devices before cleaning.
- C. Use duct-mounted access door, as required, for physical and mechanical entry and for inspection.
 1. Install additional duct-mounting access doors to comply with duct cleaning standards.
 2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection. Notify COTR of and damaged or deteriorated flexible ducts.
 3. Disconnect and reconnect flexible connectors as needed for cleaning and inspection. Notify COTR of and damaged or deteriorated flexible connectors.
 4. Notify COTR of and damaged or deteriorated fusible links on fire and smoke dampers.
 5. Remove and reinstall ceiling components to gain access for duct cleaning. Clean ceiling components after they have been removed and replaced.
- D. Mark position of dampers and air-directional mechanical devices before leaning, and restore to their marked position upon completion.
- E. Particulate Collection and Odor Control:
 1. Where venting vacuuming system inside building, use HEPA filtration with 99.97 percent collection efficiency for 0.3 micron size (or greater) particles.
 2. When venting vacuuming system outside building, use filtration to contain debris removed from the HVAC system and locate exhaust down wind and away from air intakes and other points of entry into building.
- F. Clean the following metal duct system components by removing visible surface contaminants and deposits:
 1. Air outlets and inlets (registers, grilles and diffusers).
 2. Return air ducts, dampers and actuators, except in ceiling plenums and mechanical rooms.
 3. Dedicated exhaust and ventilation components.
- G. Mechanical Cleaning Methodology:
 1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.

2. Use vacuum collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of ducts so areas being cleaned are under negative pressure.
3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts or duct liner.
4. Clean fibrous glass duct liner with HEPA vacuuming equipment, and do not permit duct liner to get wet. Inform COTR of any fibrous glass duct liner that is damaged, deteriorated or delaminated or that has friable material, mold or fungus growth.
5. Provide operative drainage system for wash down procedures.

H. Cleanliness Verification:

1. Verify cleanliness after mechanical cleaning and before application of treatment, including biocidal agents and protective coatings.
2. Visually inspect metal duct systems for contaminants.
3. Where contaminants are discovered, reclean and reinspect duct systems.

3.3 DUCT ACCESSORIES INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's 'HVAC Duct Construction Standards - Metal and Flexible'.
- B. Provide duct accessories of materials suited to duct materials; use galvanized steel in galvanized steel ducts, stainless steel accessories in stainless steel and PVC coated ducts and aluminum accessories in aluminum ducts.
- C. Install duct mounting access doors where access doors do not currently exist to allow for the cleaning of ducts, accessories and terminal units as follows:
 1. On both sides of duct coils.
 2. Downstream from volume dampers, turning vanes and equipment.
 3. Adjacent to fire or smoke dampers.
 4. Before and after each change in direction, at maximum 50 foot spacing.
 5. On sides of duct where adequate clearance is available.
- D. Install the following sizes for duct mounting, rectangular access doors:
 1. One-Hand or Inspection Access: 8 by 5 inches.
 2. Two-Hand Access: 12 by 6 inches.
 3. Head and Hand Access: 18 by 10 inches.
 4. Head and Shoulders Access: 21 by 14 inches.
 5. Body Access: 25 by 14 inches.
- E. Install the following sizes for duct mounting, round access doors:
 1. One-Hand or Inspection Access: 8 inches.

2. Two-Hand Access: 10 inches.
3. Head and Hand Access: 12 inches.
4. Head and Shoulders Access: 18 inches.
5. Body Access: 24 inches.

3.4 CONNECTIONS

- A. Reconnect ducts to fans and air handling units with existing flexible connectors after cleaning ducts and flexible connectors.
- B. Reconnect terminal units to supply ducts with existing flexible ducts.
- C. Reconnect diffusers to low-pressure ducts with existing flexible ducts.

3.5 FIELD QUALITY CONTROL

- A. Gravimetric Analysis: Section of metal duct system, chosen randomly by COTR, may be tested for cleanliness according to NADCA vacuum test gravimetric analysis.
 1. If analysis determines that levels of debris are equal to or lower than suitable levels, system shall have passed cleanliness verification.
 2. If analysis determines that levels of debris exceed suitable levels, system will have failed cleanliness verification and shall be recleaned and reverified.
- B. Report test results in writing.

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